



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
02.09.1998 Bulletin 1998/36

(51) Int Cl. 6: **C12M 1/40, C12Q 1/26,**  
**C12Q 1/00**

(43) Date of publication A2:  
07.05.1997 Bulletin 1997/19

(21) Application number: **96810200.4**

(22) Date of filing: **01.04.1996**

(84) Designated Contracting States:  
**BE CH DE ES FR GB IT LI NL SE**

(30) Priority: **30.10.1995 EP 95810670**  
**30.11.1995 EP 95810752**

(71) Applicant: **Ciba-Geigy Japan Limited**  
**Hyogo-ken 665 (JP)**

(72) Inventors:  
• **Asakura, Toshikage**  
**Osaka (JP)**

- **Yamato, Hitoshi**  
**Hyogo (JP)**
- **Ohwa, Masaki**  
**Kobe City 657 (JP)**
- **Khan, Golan Faruque**  
**Kobe-shi, Hyogo (JP)**

(74) Representative: **Becker, Konrad et al**  
**Novartis AG**  
**Patent- und Markenabteilung CH**  
**Lichtstrasse 35**  
**4002 Basel (CH)**

(54) **Enzyme electrode**

(57) Disclosed is an enzyme electrode which comprises

- (a) an electroconductive support member (ESM) comprising a porous electroconductive layer,
- (b) an enzyme adsorbed or immobilized onto the surface of said porous layer in an catalytically effective amount, and

(c) a protecting layer to prevent leaching of said enzyme from the porous layer.

The electrode may be used for indicating amperometrically the catalytic activity of an enzyme in the presence of a liquid containing substance acted upon by the enzyme and to be detected, and in the presence of an electric potential on the electrode.

**EP 0 771 867 A3**



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 96 81 0200

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant in claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,X	US 4 970 145 A (BENNETTO HUGH P ET AL) 13 November 1990  * column 5, line 39 - column 6, line 21 * * column 7, line 10 - line 23 * * column 7, line 63 - column 8, line 2 * * column 8, line 61 - column 9, line 3 * * column 9, line 9 - line 33; claims *	1-11, 17-19, 24-28	C12M1/40 C12Q1/26 C12Q1/00
Y	---	29	
D,Y	US RE34514 E (WERNET WOLFGANG ET AL) 18 January 1994 * abstract; claim 1 *	29	
A	DATABASE WPI Section Ch, Week 8912 Derwent Publications Ltd., London, GB; Class A89, AN 89-091252 XP002071121 & JP 63 307 350 A (CAMBRIDGE LIFE SCIENCES) * abstract *	1,2,4	
A	DATABASE WPI Section Ch, Week 9519 Derwent Publications Ltd., London, GB; Class A26, AN 95-144925 XP002071122 & JP 07 070 312 A (NEC CORP) * abstract *	12,29	TECHNICAL FIELDS SEARCHED (Int.Cl.6) C120
A	DATABASE WPI Section Ch, Week 8723 Derwent Publications Ltd., London, GB; Class B04, AN 87-159652 XP002071123 & JP 58 061 459 A (HITACHI LTD) * abstract *	18-20	
	---		
	---/---		
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 10 July 1998	Examiner Ceder, O
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>a : member of the same patent family, corresponding document</p>			



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 96 81 0200

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 415 124 A (NIPPON ELECTRIC CO) 6 March 1991 * abstract; claims 1,4 *	21-23	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 10 July 1998	Examiner Ceder, O
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (Pct/C01)

**THIS PAGE BLANK (USPTO)**